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First Virginia Records of Four Exotic Noctuoid Moths, with Additional Records for Two Other Introduced Species (Lepidoptera)

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ABSTRACT

The noctuoid moths *Dinumma deponens* Walker (Family Erebidae), *Amphipyra tragopoginis* (Clerck), *Niphonyx segregata* (Butler), and *Omphaloscelis lunosa* (Haworth) (Family Noctuidae), all native to the Old World, are reported from Virginia (USA) for the first time. Additional Virginia records are provided for two other introduced noctuoids, *Rusicada privata* (Walker) and *Noctua pronuba* (L.), both of which were previously reported from the state.

Keywords: *Amphipyra tragopoginis*, *Dinumma deponens*, *Niphonyx segregata*, *Noctua pronuba*, *Omphaloscelis lunosa*, *Rusicada privata*, exotic species, new records, Erebidae, Noctuidae.

INTRODUCTION

The actual and potential adverse impacts of exotic (non-native) species on native species, communities, and ecosystems has received much attention from ecologists, land managers, and others in recent decades (e.g., see reviews by D'Antonio & Chambers, 2006; Sax & Gaines, 2008; Traveset & Richardson, 2014; Gallien & Carboni, 2017; González-Suárez & González-Moreno, 2017). Invasive exotic insects can negatively affect native biodiversity through various interactions such as herbivory, predation, competition, disease transmission, and pollination disruption, in some instances even impacting ecosystem processes through cascading effects (Kenis et al., 2008).

Only about a dozen (1%) of the approximately 1,200 species of macromoths documented in Virginia are exotic species (Roble, unpub. data). The best known of these is the gypsy moth, *Lymantria dispar* (L.), a major defoliator of deciduous forests that was accidentally introduced to eastern North America from Europe in 1868 or 1869 (Elkinton & Liebhold, 1990). Vast amounts of time, money, pesticides, and biocontrol measures have been devoted to reducing populations of this species, which was first detected in northern Virginia around 1980 (Virginia Tech, 2018). It has continued to spread southward in the Appalachians, the leading edge of its ever-expanding range currently extending to Tazewell and Wythe counties in southwestern Virginia (VDACS, 2018). Numerous isolated outbreaks, often the result of unintentional transport of egg masses attached to vehicles, have also been documented in the state. Currently, only far southwestern Virginia and several other counties bordering North Carolina in western Virginia fall outside of the state's gypsy moth quarantine zone delineated by the Virginia Department of Agriculture and Consumer Services (VDACS, 2018).

In contrast, little attention has been paid to most of the other exotic macromoths, several of which are recent arrivals to the state. Zahiri et al. (2017; supplemental Table S3) prepared a list of 35 noctuoid moths that are believed to be non-native inhabitants of North America. Schmidt et al. (2018) recently added another species (*Omphaloscelis lunosa* [Haworth]) to the North American fauna that belongs on that list (see below). Ten of these species occur in Virginia (Table 1), four of which are reported herein from the state for the first time. I also provide additional Virginia records for two other introduced noctuoids. Two of the newly reported species were first documented in the state, and apparently North America in one case, by amateur naturalists.

The following acronyms refer to specimen collections: National Museum of Natural History (NMNH), Smithsonian Institution, Washington, DC; Virginia Polytechnic Institute and State University

(VPISU), Blacksburg, Virginia; Virginia Museum of Natural History (VMNH), Martinsville, Virginia; and Virginia Department of Conservation and Recreation, Division of Natural Heritage (VDCR-DNH), Richmond, Virginia. Most specimens collected by VDCR-DNH staff and collaborators are deposited in NMNH, VMNH or a reference collection at the agency's headquarters in Richmond. Specimens collected in national parks (e.g., Shenandoah National Park, Blue Ridge Parkway) have been returned to the respective parks in compliance with U.S. National Park Service policy. The common names listed for each species below were taken from various sources, including Wagner et al. (2011) and the Moth Photographers Group (MPG), Butterflies and Moths of North America (BAMONA), and BugGuide websites. The checklist numbers of Lafontaine & Schmidt (2010) and Hodges et al. (1983), respectively, precede the species' names. Decimal numbers signify additions to their original lists.

FAMILY EREBIDAE

930611.1/8554.5 *Dinumma deponens* Walker, 1858
[No common name]

The first documented U.S. record of this Asian species was obtained in 2012 in northern Georgia; within a year it had been recorded from five southeastern states, including Alabama, Georgia, North Carolina, South Carolina, and Tennessee (Adams et al., 2013). The local hostplant is mimosa tree [= silk tree] (*Albizia julibrissin* Durazz.), a widely planted ornamental in eastern United States that is classified as an invasive species in some states. Photographs submitted to several websites, including BugGuide, BAMONA, and MPG, collectively document *D. deponens* from 15 states ranging from New Jersey, New York, and Ohio south to Florida, Alabama, and Louisiana, indicating a rapid expansion of its range in North America in less than a decade. I am aware of nine Virginia records dating to 2015, most of which were obtained by amateur naturalists, consisting of one voucher specimen and seven photographic records. Most of the records are from the Greater Richmond metropolitan area (Fig. 1).

Specimen record: Chesterfield Co., Scotford Road [inside shed], 1.2 km SE jct. Rt 175 and 679, 260´, 19 March 2017, S.M. Roble (VDCR-DNH, 1).

Photographic records: Chesterfield Co., "4th floor of an office bldg in an office park" [Boulders Parkway area], 14 and 17 September 2015, M. Coker (BAMONA record 1065301; photographs of two apparently different moths). Chesterfield Co., [Silverleaf Terrace], 12 September 2016, P. Bedell (BugGuide photo 1291805;

Table 1. Non-native species of noctuoid moths known to occur in Virginia.

Family	Species	First Virginia record
Erebidae	*Lymantria dispar* (L.)	ca. 1980
Erebidae	*Rusicada privata* (Walker)	Forbes (1954)
Erebidae	*Dinumma deponens* Walker	2015 (this paper)
Nolidae	*Garella nilotica* (Rogenhofer) [1]	? (widespread in North America)
Noctuidae	*Trichoplusia ni* (Hübner) [1]	? (widespread in North America)
Noctuidae	*Niphonyx segregata* (Butler)	2008 (this paper)
Noctuidae	*Amphipyra tragopoginis* (Clerck)	1998 (this paper)
Noctuidae	*Spodoptera exigua* (Hübner)	? (widespread in North America)
Noctuidae	*Noctua pronuba* (L.)	1997 (Roble et al., 1999; this paper)
Noctuidae	*Omphaloscelis lunosa* (Haworth)	2013 (this paper)

[1] Old and New World populations may represent different species (J.D. Lafontaine, pers. comm.), in which case this species would be considered native in Virginia.

Fig. 1. Distribution of *Dinumma deponens* (dot = voucher specimen, triangles = photographs) and *Omphaloscelis lunosa* (star = photographs) in eastern Virginia.

BAMONA record 1102060; iNaturalist record 4102056). Powhatan Co., Rt. 634, Swift Creek, 22 April 2019, J. Reilly. Westmoreland Co., [Hague], 3 June 2018 and 20 October 2018, K.C. Bergdoll (iNaturalist records 13087692 and 17674308). City of Alexandria, Beverley Drive, 5 September 2018, R. Lohamm (iNaturalist record 16336234). City of Richmond, [West 45th Street], 10 July 2017, A. Belden (BAMONA record 1125364; see also Figs. 2A-2B).

FAMILY NOCTUIDAE

931545/9639 *Amphipyra tragopoginis* (Clerck, 1759) [Mouse Moth]

Forbes (1954) suggested that there was some uncertainty regarding whether this small, brown nondescript moth is a Holarctic species or if it was introduced to North America from Eurasia, but Zahiri et al. (2017) subsequently included *A. tragopoginis* in their list of exotic noctuoids in North America. Its absence from high latitude habitats in North America that typically harbor Holarctic species, combined with its historical presence near areas of human habitation, strongly support the conclusion that *A. tragopoginis* was introduced to this continent (Mikkola et al., 1991). Forbes (1954) summarized the North American range of this general feeder as "Newfoundland and southern Canada south to Pennsylvania, west to the Mississippi; sometimes rather common; British Columbia." Subsequent records are now available from Maryland (Glaser et al., ms, 3 counties; NMNH, 8 specimens [oldest 1987]), West Virginia (MPG, 2 counties; iNaturalist, Pendleton Co., C. Lehman, 2011; NMNH, 5 specimens [all 2011]), North Carolina (iNaturalist and North Carolina Biodiversity Project; 5 counties, first record 1998), and Virginia (first record 1998; see below). The recent nature of all of these records at the southern end of its range in the Appalachians suggests that *A. tragopoginis* is continuing to expand its range in North America. Alternatively, these records could merely reflect increased survey and observational efforts south of Pennsylvania in recent decades.

I did not find any museum or literature records of *A. tragopoginis* from Virginia, nor any recent online photographic records (e.g., BAMONA, BugGuide, iNaturalist, MPG). However, statewide sampling by VDCR-DNH staff and collaborators during the past three decades has resulted in the collection of the following 14 voucher specimens from eight sites (Fig. 3) in the Blue Ridge and Ridge and Valley physiographic provinces of western Virginia that fill the gap in the range between Maryland and North Carolina.

Bath Co., Warm Springs Mountain, Bald Knob, 7 July 1999, J.C. Ludwig (3); same locality but 3 August 1999, J.C. Ludwig and S.M. Roble (1). Bedford Co., Blue Ridge Parkway, Peaks of Otter Recreation Area, Sharp Top Mountain, 28 June 2001, J. Basinger (1). Floyd Co., Buffalo Mountain, 30 June 2000, S.M. Roble (2); 2.5 km W of Willis, 22 June 2004, S.M. Roble (2). Grayson Co., Grayson Highlands State Park, Massie Gap, headwaters of Quebec Branch, "Sullivan Swamp", 30 June 2011, S.M. Roble (1); Jefferson National Forest, Whitetop Mountain, 22 July 2014, S.M. Roble (1). Page Co., Shenandoah National Park, Blackrock [Big Meadows area], 14 July 2005, A.C. Chazal and R.D. Knisley (1). Wythe Co., Sand Mountain, 23 July 1998, S.M. Roble, C.S. Hobson, and B. Charles (2).

Seven of the eight sites are on mountaintops (elevational range 1097–1646 m [3600–5400′]), mostly in deciduous forests, but they include a pitch pine-scrub oak barren, mafic glade, mountain bog, and red spruce forest. The remaining site is a sedge-dominated seepage wetland (823 m [2700′]).

932615.1/9956.1 *Omphaloscelis lunosa* (Haworth, 1809)
[Lunar Underwing]

The first U.S. report of this common but variable western European species that closely resembles the native North American species *Sericaglaea signata* (French) (Variable Sallow) originated from eastern Maryland in 2015 (Schmidt & Lafontaine, 2018). It is currently known from two counties in that state, the oldest record having been obtained in 2014 (Maryland Biodiversity Project). In addition to their similar appearance, both species are active in the fall, which may have led to initial misidentification or unresolved identification of some BugGuide photo submissions. However, recent reexamination of these images by BugGuide editors and reviewers (T. Reichard and H. McGuinness) has revealed the existence of several *O. lunosa* images from Fairfax County, Virginia that predate the Maryland records (BugGuide). This species has been photographed (Fig. 2C) annually at a private residence in Reston (date range September 28–October 20; T. Calkins, pers. comm.) from 2013–2018, with an image obtained on 12 October 2013 apparently constituting the earliest documentation of *O. lunosa* in North America (BugGuide). No other Virginia records of this species are currently known (Fig. 1), but I anticipate that *O. lunosa* will continue to expand its range in the metropolitan District of Columbia region and beyond in the coming decades. Nature enthusiasts will likely contribute the majority of new distributional records documenting this phenomenon via their submissions to websites such as BugGuide, BAMONA, and iNaturalist.

932716/9558.1 *Niphonyx segregata* (Butler, 1878)
[Hops Angleshade]

To date, there have been few references to this Asian species in the literature on North American moths (e.g., Lafontaine & Schmidt, 2010). A hop feeder, it is endemic to eastern Asia, including the Russian Far East, the Korean Peninsula, Japan, China, and Taiwan (BOLD systems). It is believed to have been introduced into the northeastern U.S. in the 1990s, where the first record was obtained on Long Island, New York (Lafontaine & Schmidt, 2010). Photographs submitted to BugGuide, BAMONA, MPG, and the North Carolina Biodiversity Project collectively document *N. segregata* from 10 states ranging from Massachusetts and New York south to North Carolina.

The earliest documentation of *N. segregata* in Virginia is based on a specimen that I collected along the James River in the spring of 2008. Currently, there are at least 13 specimen records from the Commonwealth, all but one obtained by VDCR-DNH staff and collaborators: Buckingham Co., James River at New Canton boat landing, Co. Rt. 670, 27 May 2011, S.M. Roble (NMNH, 1; VDCR-DNH, 1). Cumberland Co., James River at Columbia boat landing, Co. Rt. 690, 22 May 2012, S.M. Roble and A.C. Chazal (VDCR-DNH, 1). Fairfax Co., Fort Belvoir, Area F-1 near Pohick Creek, 9 August 2012, C.S. Hobson and J. Pilcicki (1); same but Area T9 (1). Goochland Co., James River at West View boat landing, Co. Rt. 643, 30 May 2008, S.M. Roble (NMNH, 1); same but 11 May 2011 (NMNH, 1); same but 28 May 2011 (NMNH, 2; VDCR-DNH, 1); same but 22 May 2012, S.M. Roble and A.C. Chazal (NMNH, 1), same but 16 August 2013, S.M. Roble (VDCR-DNH, 2). *Niphonyx segregata* has also been collected along the Mattaponi River: King and Queen Co., 0.5 mi NE Aylett, 8 June 2013, P. Dennehy (P. Dennehy collection, 1).

I am also aware of the following photographic records obtained in Virginia: Augusta Co., Verona, 6 August 2014, M. Morris (BugGuide photo 974448; see also Fig. 2D). Buckingham Co., Warren Ferry Road, 10 July 2018, J. Gallagher (iNaturalist record 14406451). Henrico Co., Glen Allen, 23 August 2017, K. Richardson (iNaturalist record 7616032). City of Richmond, James River [James River Park, "The Wetlands"], on Japanese hops, 2 August 2016, A. Belden (BAMONA record 1093704). City of Richmond, James River Park [Pony Pasture, photographed on Japanese hops], 21 August 2016, R. Young (iNaturalist record 3933189). City of Staunton, 31 May 2011, M. Morris (BugGuide photo 634653).

The known distribution of *N. segregata* in Virginia is shown in Figure 3, with most records from along the James River. I have collected adults during the day on Japanese hops (*Humulus japonicus* Siebold & Zucc.), an exotic plant that forms dense monocultures along the banks of the river in many areas, and also taken adults at ultraviolet light along the river's shoreline.

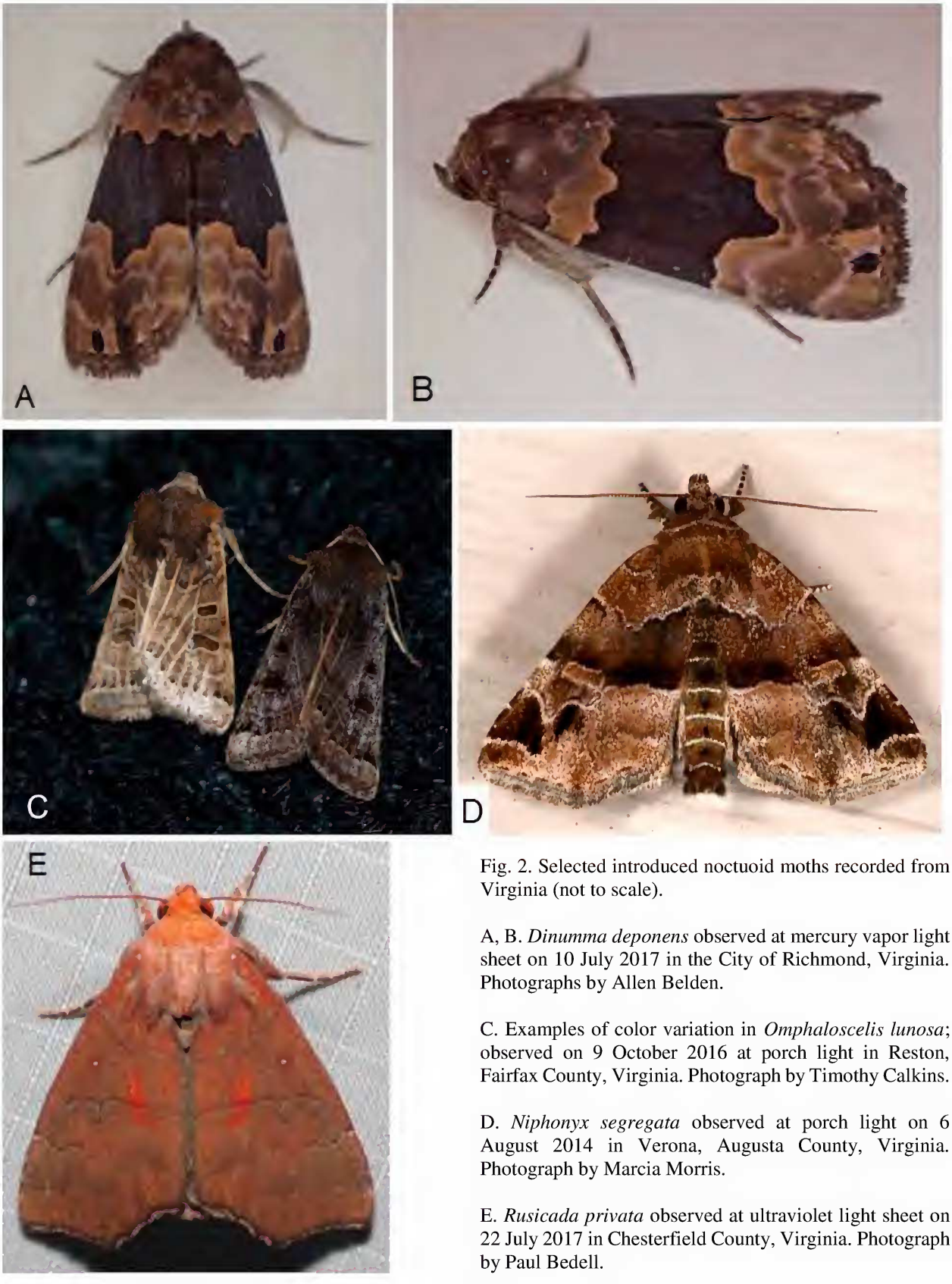

Fig. 2. Selected introduced noctuoid moths recorded from Virginia (not to scale).

A, B. *Dinumma deponens* observed at mercury vapor light sheet on 10 July 2017 in the City of Richmond, Virginia. Photographs by Allen Belden.

C. Examples of color variation in *Omphaloscelis lunosa*; observed on 9 October 2016 at porch light in Reston, Fairfax County, Virginia. Photograph by Timothy Calkins.

D. *Niphonyx segregata* observed at porch light on 6 August 2014 in Verona, Augusta County, Virginia. Photograph by Marcia Morris.

E. *Rusicada privata* observed at ultraviolet light sheet on 22 July 2017 in Chesterfield County, Virginia. Photograph by Paul Bedell.

ADDITIONAL RECORDS

The following two introduced noctuoid moths were reported previously from Virginia, but updated information on their distribution in the state has not been published until now.

Erebidae

930604/8547 *Rusicada privata* (Walker, 1865)
[Hibiscus Scalloped Moth, Hibiscus-leaf Caterpillar Moth]

Forbes (1954) discussed this Asian species (as *Anomis commoda* [Butler, 1878]) in his treatise on the moth fauna of New York and eastern North America, noting the existence of a record from Arlington, Virginia. More than a half century later, Wagner et al. (2011) remarked that, unlike several related migratory species, it seems to be rather sedentary because it had spread only as far as eastern Massachusetts and southeastern Virginia in the approximately seven decades since its introduction to North America near Moorestown, New Jersey. However, current maps on the BugGuide, BAMONA, and MPG websites include records (all based on photographs) of *R. privata* that extend from New Hampshire and Vermont south to the Carolinas, Tennessee, and Georgia, with an apparently disjunct record in extreme southern Texas, thus documenting a much larger range.

I have not seen any additional museum specimens from Virginia since the report by Forbes (1954), but have collected several larvae on Rose of Sharon (*Hibiscus syriacus* L.) bushes (an exotic ornamental) and captured several adults in my suburban Richmond yard: Chesterfield Co., Scotford Road, ca. 1.2 km SE jct. Rt 175 and 679, reared larva emerged 7 January 2001, S. M. Roble (VDCR-DNH, 1); same but emerged August 2003; same but larva collected on Rose of Sharon, 1 August 2003, pupated but failed to emerge (not kept); same but single adults collected at incandescent light on 1 May 2003, 14 October 2005, 11 November 2005, 10 September 2007, and 28 August 2016 (all VDCR-DNH); I also collected an adult at a motel porch light in Warm Springs, Bath County on 10 August 2010 (VDCR-DNH, 1). The collection of the late W.R. Grooms (currently housed at VDCR-DNH) contains 10 specimens captured between 28 April and 26 September in Loudoun County (mostly Ashburn) during 2007–2009.

Photographs of *R. privata* are available on the BugGuide, BAMONA, MPG, and iNaturalist websites for the following Virginia jurisdictions: Augusta (M. Morris, 2013, 2015), Chesterfield (P. Bedell, 2016, 2017; see Fig. 2E), Culpeper (L. Alloway, 2018 [larva]), Fairfax (anonymous, 2015; K. Rosenthal, 2018), Prince William (J. Gallagher, 2010, 2017), and Rockingham (D. Wendelken, 2016) counties, and the cities of Richmond (A. Belden, 2015) and Williamsburg (M. Anthony, 2018; N. Newberry, 2018). The known distribution of *R. privata* in Virginia is shown in Figure 4.

Despite the current lack of confirmed records for southwestern Virginia, *R. privata* occurs regularly in areas of the North Carolina mountains where Rose of Sharon is present in abundance, and the larvae defoliate the shrubs occasionally (J.B. Sullivan, pers. comm.). Future sampling will likely identify populations of *R. privata* in southwestern Virginia.

Noctuidae

933551/11003.1 *Noctua pronuba* (Linnaeus, 1758)
[Large Yellow Underwing, Large Yellow-winged Dart, European Yellow Underwing]

Noctua pronuba is native to Europe and northern Africa, ranging eastward to India (Lafontaine, 1998). It was introduced into North America at Halifax, Nova Scotia around 1979 (Neil, 1981). This highly variable species spread rapidly across North America, reaching the West Coast in less than three decades (Passoa & Hollingsworth, 1996; Wagner et al., 2011; see also BAMONA and MPG range maps). Roble et al. (1999) documented the first Virginia records, reporting it from the following jurisdictions on the basis of 13 specimens collected by VDCR-DNH staff during 1998–1999: Accomack, Bath, Fairfax, Nottoway, Prince William, and Wythe counties and the City of Virginia Beach. An addendum to that paper cited a collection from the Fauquier-Prince William county line (Roble, 2000). Subsequent ultraviolet light trapping throughout Virginia by me and other VDCR-DNH staff has yielded collections from 24 additional counties: Albemarle, Augusta, Bedford, Brunswick, Chesterfield, Dickenson, Dinwiddie, Floyd, Giles, Grayson, Greene, Hanover, Highland, Madison, Montgomery, Northampton, Page, Pulaski, Rockbridge, Rockingham (specimen also in K. Richers collection), Russell, Smyth, Warren, and Wise. I have also seen one specimen each from Loudoun (W.R. Grooms collection) and Southampton (VPISU) counties, the latter collected in July 1997 and thus apparently the first documented record for the state. *Noctua pronuba* was also collected in Lancaster County in August 2012 (P. Dennehy collection, 1). Photographs submitted to the BugGuide, BAMONA, MPG, and iNaturalist websites add Clarke, Frederick (larva), Roanoke (larva), Tazewell, and Washington counties and the cities of Alexandria (larva), Harrisonburg, Radford (larva), and Richmond to the known Virginia

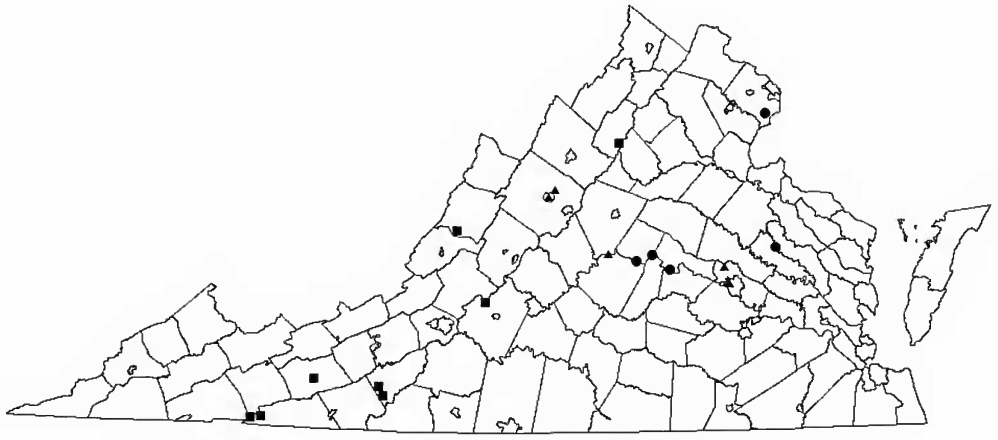

Fig. 3. Distribution of *Amphipyra tragopoginis* (squares = voucher specimens) and *Niphonyx segregata* (dots = voucher specimens, triangles = photographs) in Virginia.

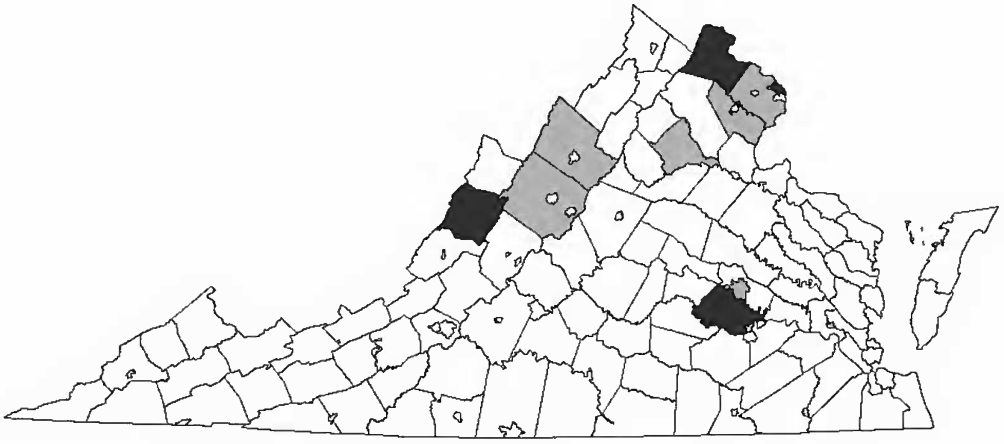

Fig. 4. County and city distribution of *Rusicada privata* in Virginia (dark shading = voucher specimens, light shading = photographs).

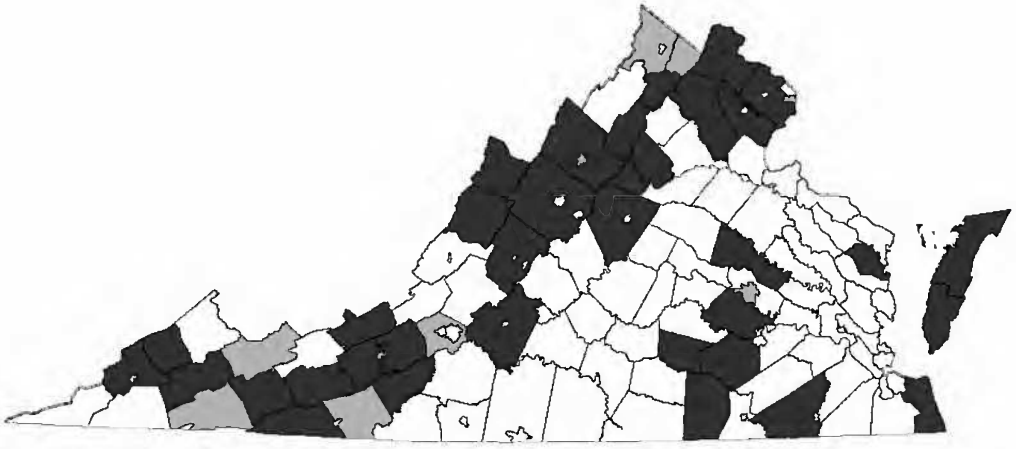

Fig. 5. County and city distribution of *Noctua pronuba* in Virginia (dark shading = voucher specimens, light shading = photographs).

distribution (Fig. 5). *Noctua pronuba* has also been photographed in Carroll County (W. Cook website).

The larvae of *N. pronuba* feed on a wide variety of weedy and cultivated herbaceous plants including grasses, chrysanthemums, carnations, strawberries, tomatoes, potatoes, grapes, carrots, beets, cabbage, and lettuce (Passoa & Hollingsworth, 1996).

OTHER INTRODUCED NOCTUOIDS

Several other introduced noctuoid moths that currently inhabit eastern North America may eventually be documented in Virginia as their ranges expand, and future arrivals to the continent may also occur in Virginia. The following two readily identifiable, exotic noctuids (images available in Beadle & Leckie [2012] and various websites) have been recorded from counties adjacent to Virginia within the past decade. These species will undoubtedly be added to the state's fauna in the near future.

931771/10177 *Calophasia lunula* (Hufnagel, 1766)
[Toadflax Brocade Moth]

This European species was introduced into North America (initially Canada) for the biological control of toadflax (*Linaria* spp.) (McDermott et al., 1990). The MPG map shows that its current North American range includes the Pacific Northwest and northeastern U.S., south to Maryland and West Virginia. This species is known from two counties in western Maryland, with the earliest records obtained in 1994 (Glaser et al., ms; Maryland Biodiversity Project). It was recorded in Pendleton County, West Virginia by C. Lehman in August 2011 (BugGuide photo 565664). This county borders Augusta, Highland, and Rockingham counties in western Virginia. The larvae feed on *Linaria vulgaris* P. Mill. (yellow toadflax, butter-and-eggs), which is a widespread, common weed in Virginia (VBA, 2018).

932363/9385.1 *Lateroligia ophiogramma* (Esper, 1793)
[Double Lobed Moth]

A borer of marsh plants with thick stems, such as *Phalaris* (canary grass) and *Phragmites* (common reed), this introduced Eurasian species is currently spreading in northeastern Canada and the U.S. (Mikkola et al., 2009). The MPG map shows a transcontinental range across the northern U.S. and southern Canada, extending south to Pennsylvania and Ohio with a disjunct record for western North Carolina. There are also two recent records (2015–2016) from Maryland (Maryland Biodiversity Project). Since 2007, *L. ophiogramma* has been recorded in three counties (Alleghany, Ashe, and Avery) in northwestern North Carolina (BugGuide, iNaturalist, and North Carolina Biodiversity Project websites), the first two of which border Grayson County, Virginia. Suspected host plants in North Carolina include ornamental grasses such as zebra grass (*Miscanthus sinensis*) and pampas grass (*Cortaderia selloana*) (J. B. Sullivan, pers. comm.).

The following introduced species is also likely to be found in Virginia eventually given the abundance of its hostplant in coastal areas of the state.

932437/9447.2 *Rhizedra lutosa* (Hübner)
[Large Wainscot Moth]

McCabe & Schweitzer (1991) first documented this Eurasian species in North America in 1988 from New Jersey salt marshes, where the larvae feed on the introduced common reed (*Phragmites australis* [Cav.] Trin. ex Steud.). The moth has since spread west, north, and south (e.g., New York, Mikkola & Lafontaine, 1994; Michigan, Summerville, 1998). Mikkola & Lafontaine (1994) speculated that *R. lutosa* (and two other noctuids) was introduced to North America via modern ships containing fragments of *Phragmites* or other grasses harboring immature life stages of the moth.

A non-native genotype (nominate subspecies) of common reed colonized North America and has become widespread and abundant across the continent during the past 150 years (Saltonstall, 2002). In Virginia, it is an abundant, highly invasive species that readily colonizes suitable wetland habitats in coastal areas and is known from about half of the counties in the state (VBA, 2018). Common reed forms nearly monotypic stands that are of limited value to wildlife (Marks et al., 1994). Recent studies have revealed that there is also a more localized, native North American genotype (subspecies *americana*) of common reed (Saltonstall et al., 2004). In Virginia, it is known from only three counties in the Coastal Plain (VBA, 2018).

Blossey & Weber (2000) briefly sampled two stands of exotic common reed in coastal Virginia for insect herbivores. They documented four introduced insects new to the Virginia fauna, but did not detect *R. lutosa*. However, their sampling was conducted in early spring and did not include ultraviolet light trapping for adults. The deployment of such traps in coastal marshes containing *Phragmites* may eventually confirm the existence of this introduced moth in Virginia.

DISCUSSION

The actual or potential impacts of the introduced moths discussed above on native species and ecosystems

are poorly known. *Noctua pronuba*, a polyphagous, migratory species, is clearly the most widespread and abundant of these, and thus perhaps most worthy of study with regard to its potential impacts to native plants as well as vegetables and agricultural crops. Most of the other species apparently are feeding on introduced plants, but further information is desired on the use of native plants as hostplants by all of these species.

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